

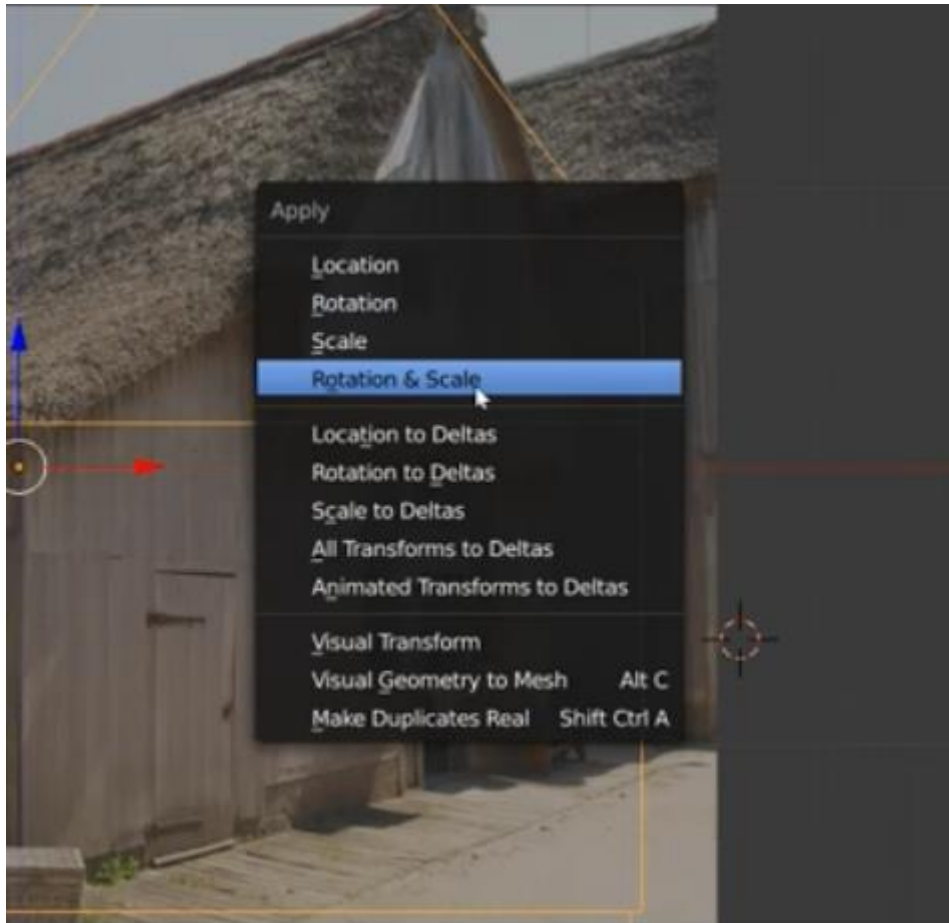
Chapter 4, lesson 40, Optimizing base

The goal in this lesson is to prepare the building to be used with the Boolean modifier. The Boolean modifier can be used to do Boolean operation between meshes. In this case we will use another mesh to cut its shape out of the building to create holes for doors and windows. Topics include the following.

- Applying scale and rotation
- Using the loop cut and slide tool to even out the mesh
- Using the bevel tool
- Additional tip section of an alternative workflow for beveling

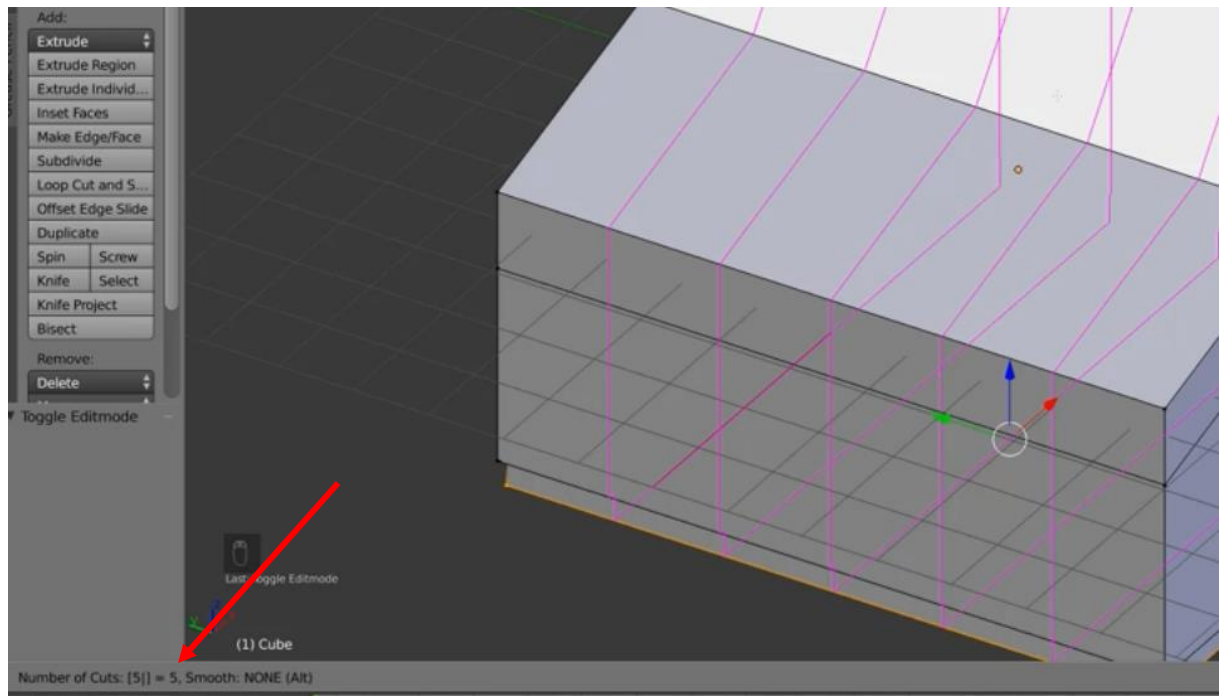
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Start with pressing **N** and check the values in the transform section while your building is selected. Look for scale and make sure that the x, y and z values are set to 1. If they are not, hit **ctrl + a** to open the apply menu and chose either scale or rotation and scale. Selecting location will move the objects origin to the center of the world. Rotation and scale won't change the orientation of the object in the 3D view but rather say something like "the objects current scale and rotation is the new starting point for all mathematical operations made on the object" and the values for scale and rotation will be reset to their default values without a change in the viewport. This may not sound very important at first but if this is not set a lot of modifiers and other operations and tools will not work as intended.

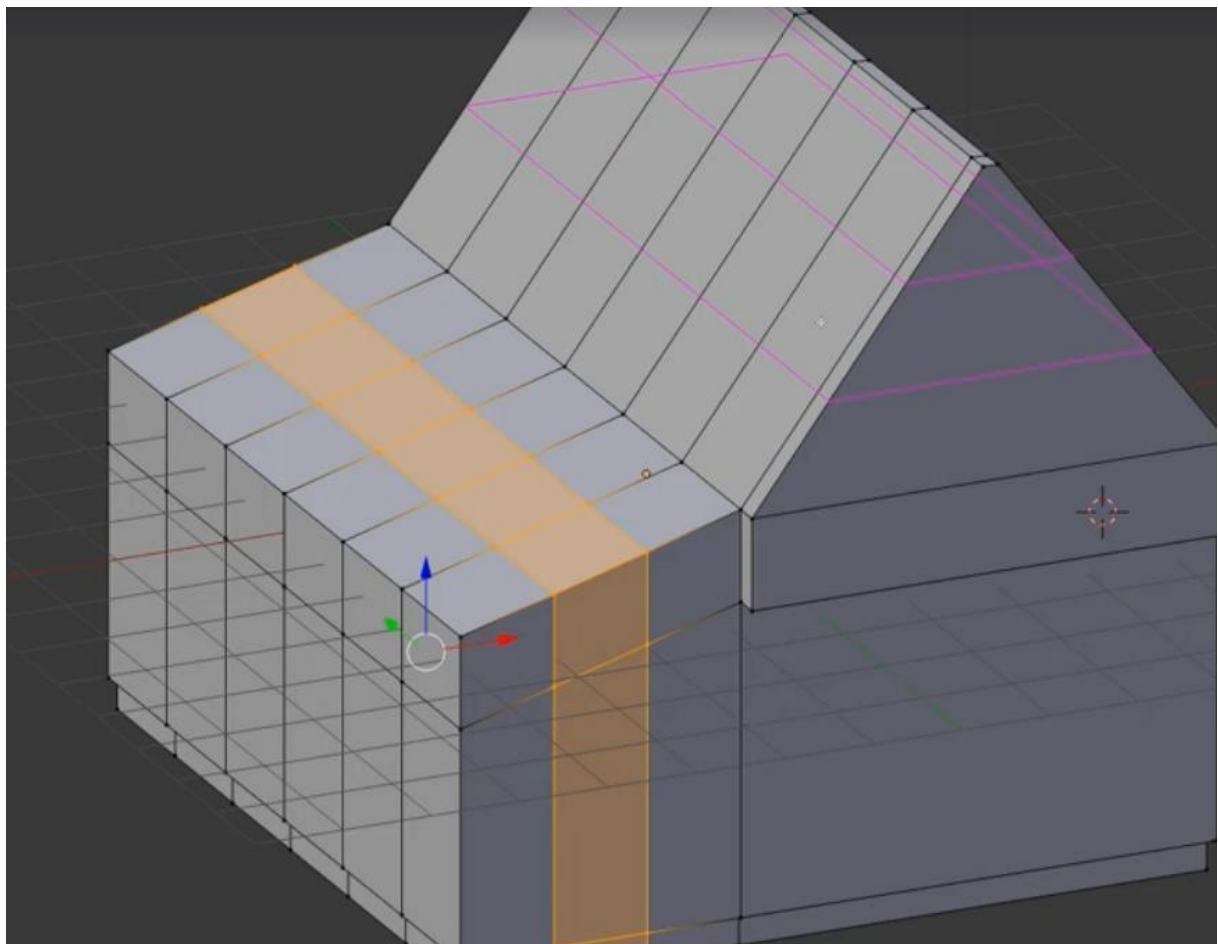


A common question is why the scale and rotation are not automatically reset to the default values and there are some reasons. One is that blender is used for other things than modelling. If these values where reset automatically for instance while animating, animation would be impossible. The easiest way to avoid having to reset rotation and scale all the time is to do all mesh manipulations in edit mode. Let us continue.

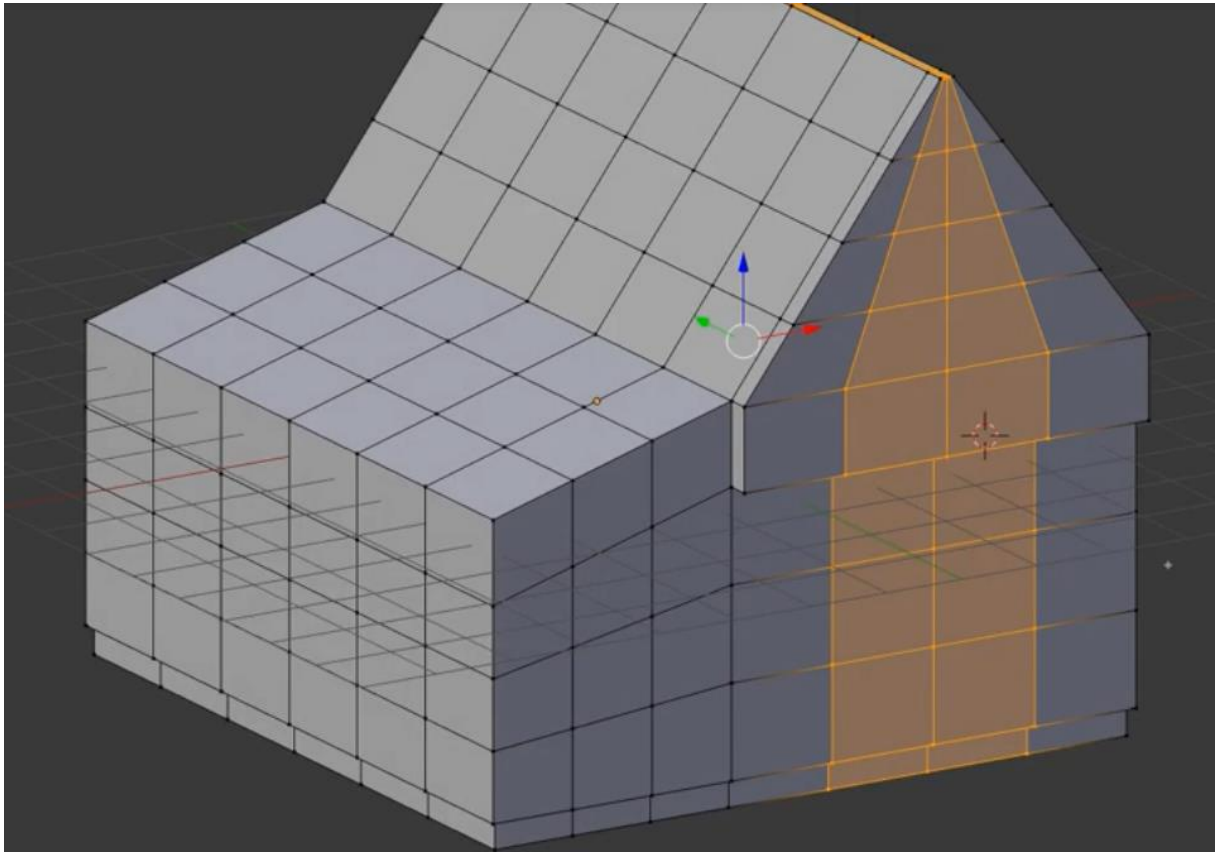
Hold middle mouse button and rotate the view, add loop cuts around the building using **ctrl + r** and scrolling the wheel to increase the number of cuts. While doing this notice how the bar below the viewport disappears and temporarily become an information area regarding the current active tool. Here you can see extra shortcuts that will influence a tool or helpful information. In the case of loop cut and slide you can see how many cuts you are currently doing.



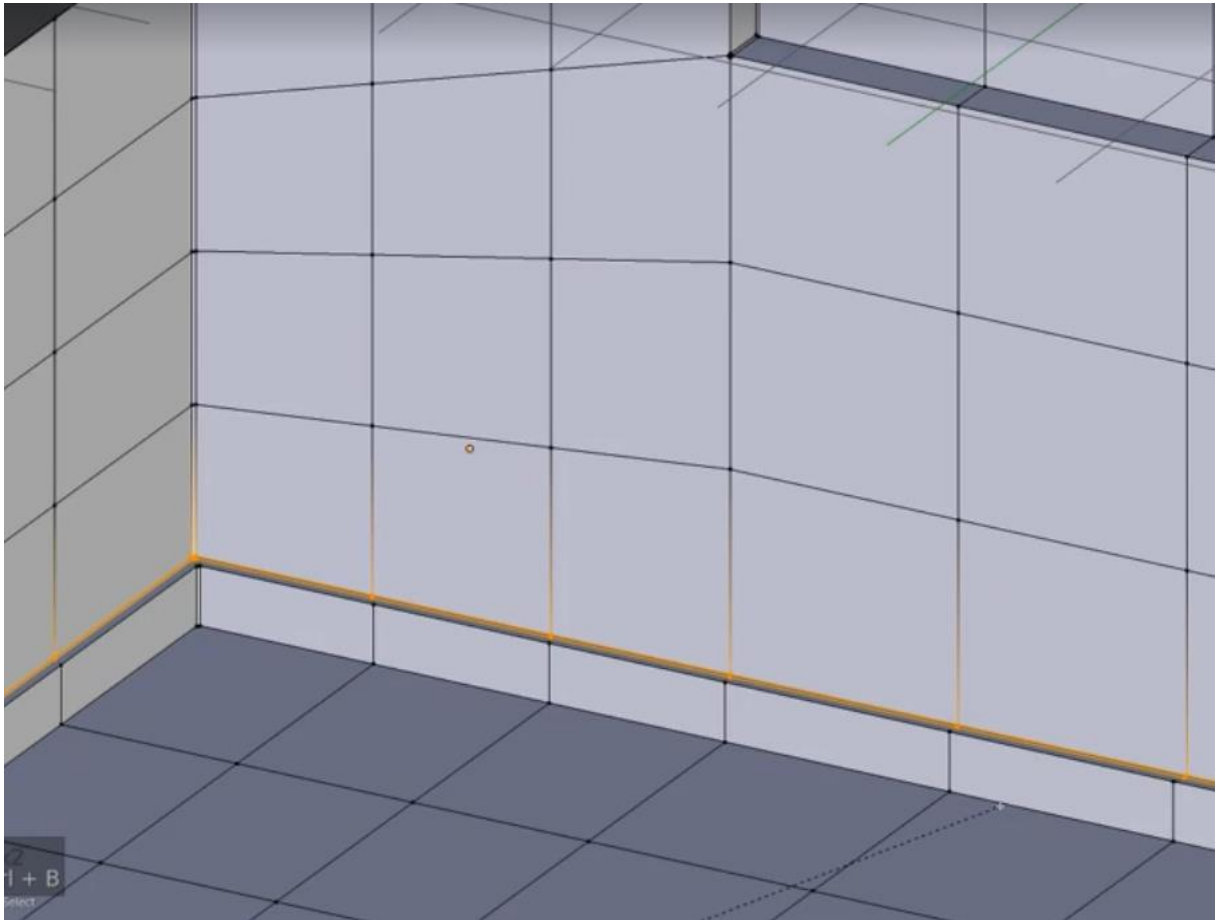
Continue doing loop cuts along the lower part of the building to intersect the previously made loop cuts. Also add cuts around the higher roof. The goal is to make square shapes to prepare the building for Boolean modifier.



Loop cuts are also added around the body of the house and from top to bottom of the higher part of the building.

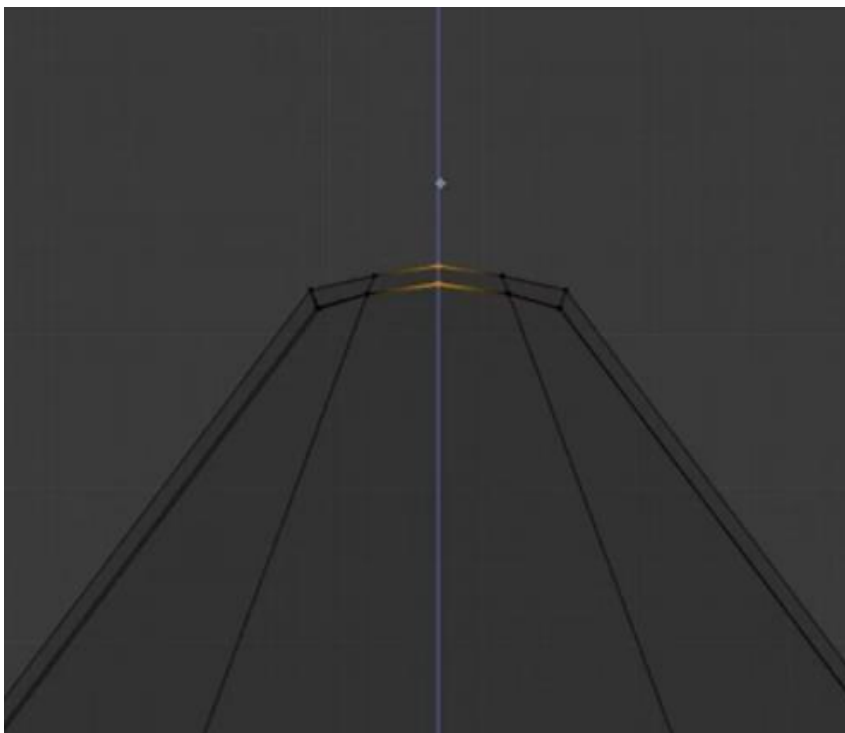


Next step is to add bevels on the edges of the building. The bevel tool has the shortcut **ctrl + B**. This is one of those tools that rely on the scale being applied as discussed earlier in the lecture. If the scale is not applied the bevel tool will behave very differently. One of the ways it may bevel is very far on one side and barely at all at the other side. You may also experience that the bevel tool will bevel to the extreme or nothing and there is nothing in between. If that happens to you, try to apply the scale and come back to the bevel tool.



The bevel will make the edge reflect light in a more realistic way. Add it along the roofs, corners of the house and at the bottom edge just before the geometry is scaled in.

Last step of this lecture is to adjust the rooftop. Select the top edges and round of the rooftop.



Additional tips for this lecture

In the additional tips for this lecture I would like to discuss an alternative workflow for beveling that is slightly more advanced but offer more control. First, we will walk through the steps to get bevels through the bevel modifier and then we will elaborate on why this could be an alternative way.

- Add a bevel modifier to the building
- Set the limit method to “weight”
- Set the width method to “width”
- Select an edge that you would like to bevel in edit mode
- Hit **ctrl + e** to bring up the edge edit menu.
- Select “edge bevel weight” and press **1** and **enter**.
- Adjust the width slider in the bevel modifier to adjust the bevel for that edge.
- Adjust the segments setting if you would like more geometry to make up the bevel.
- Mark all edges that you would like to bevel.

With this method you have a slight more advanced workflow, but you can always go back and edit where you want a bevel or how many segments you want on those bevels. If you want to have different amount of beveling on some parts of the mesh adjust the “edge bevel weight” to a value between 1 and 0. Combine this with the segments and width slider on the bevel modifier. Keep in mind that the bevel modifier is just as prone to error as the bevel tool is if the scale has not been applied on the object. If you want to adjust the geometry of the bevels manually you will have to apply the bevel modifier. If you do, you can not go back and get access to the bevel modifier settings again.

A general note about beveling is that if you bevel an uneven number of segments you will create triangles and n-gons in your mesh. This means faces with ether 3 vertices or in the case of n-gon any number of vertices above 4. For static meshes this is generally not a problem but for something that is intended to be animated this needs to be kept in check.